ERIC Document Resume	See Instruction Sheet	DATE OF RESUME	DATE RECEIVED

A. PUBLICATION DATA

1. ACCESSION NO.	2. ORIGINATOR CONTROL NO(S).	3. IDENTIFICATION NO.
ED001043	N.a.	N.a.

4. AUTHOR(S):
Board of Education, City of Chicago

5. TITLE OF DOCUMENT ABSTRACTED:
Infectious and Communicable Diseases: Resource Material for Teachers

6. PUBLICATION TITLE:
N.a.

7. EDITOR(S):
N.a.

8. PLACE OF ORIGIN
ORG. Board of Edu.
ST. City of Chicago
CITY-STATE Chicago, Ill.
TELE. EXT.
INST/LOC CODE

9. PUBLISHER OR SOURCE
Board of Education
Chicago, Illinois

10. VOL.	11. PAGES	12. MO./YR.	13. TOTAL PP.
N.a.	N.a.	64	47

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TYPE OF REPORT
PROPOSAL ☐
IN-PROGRESS ☐
FINAL ☐
FOLLOW-UP ☐

OTHER ERIC REFERENCES:

ERIC SATELLITE CODE

B. INDEXING DATA

14. SUBJECT AREA

15. TYPE OF ENDEAVOR
teacher guide

16. INDEXING TERMS (6-12)

infectious diseases	health edu.	physical edu.	
communicable diseases	disease control	high schools	
resource materials	teacher-nurses	preventive measures	
		City of Chicago	Great Cities

17. ABSTRACT (MAX. 250 WORDS)

Descriptions of twenty-five infectious and communicable diseases include causes, symptoms, effects, treatment and preventive measures. It has been discovered that respiratory ailments of a communicable nature are the most common cause of absenteeism among students. Information is intended for the use of teachers of health education or other personnel concerned with the school health education program. Materials are especially designed for use by teacher-nurses and high school teachers of health and physical education and in health education courses in teachers colleges.

ERIC No.

18. SOURCE OF ABSTRACT

C. FUNDING DATA

19. SUPPORTING ORGANIZATION	20. DIVISION OR DEPT.	21. CONTRACT NO. / PROJECT NO.
	22. TOTAL COST OF PROJECT	
	23. DURATION OF PROJECT	U.S. Department of Health, Education, and Welfare Office of Education

ERIC Form 1

INFECTIOUS and COMMUNICABLE DISEASES

Resource Material for Teachers

BOARD OF EDUCATION
CITY OF CHICAGO

375 D.841 R.1

INFECTIOUS AND COMMUNICABLE DISEASES

Resource Material for Teachers

BENJAMIN C. WILLIS
General Superintendent of Schools

BOARD OF EDUCATION
CITY OF CHICAGO

ED001043

Educational Materials Laboratory
Office of Education
MAY 1965
DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

FOREWORD

Although many of the infectious and communicable diseases can be controlled, there is still a rather high incidence of some of them among children and young people. Respiratory ailments of a communicable nature are the most common cause of absenteeism among students.

This publication is an informational booklet about infectious and communicable diseases and their control. It is designed to give pertinent background information about the most prevalent of these diseases to teachers of health education and other school personnel who are interested in and concerned with the school health education program. The material is presented especially for use by teacher-nurses and high school teachers of health and physical education. It may be used also in health education courses in teachers colleges.

The descriptions include causes, symptoms, effects, treatment, and preventive measures for the diseases outlined in the booklet. They are listed in alphabetical order and not in any order of incidence or importance.

It is hoped that this booklet will be of assistance in the administration of the total school health program in the Chicago public schools.

BENJAMIN C. WILLIS

General Superintendent of Schools

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Sincere appreciation is extended to Irving Abrams, M.D., Director of the Bureau of Medical and School Services, and to Barbara A. Hawkins, Supervisor of Health and Physical Education, for the preparation of this material.

This publication was prepared in the Bureau of Medical and School Services under the supervision of Irving Abrams, M.D., Director, and in the Bureau of Health, Physical Education, and Recreational Services under the supervision of Arthur Buehler, Director.

Cover Design by Homer Freese

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INTRODUCTION

The importance of infectious and communicable diseases has changed since the availability of antibiotics. Many infections can be controlled almost completely. Others have been reduced in importance although they still exist as potential threats to health.

Infectious diseases are those which are caused by the entrance, growth, and multiplication of bacteria, protozoans, or analogous organisms (filtrable viruses) in the body. They are germ diseases and may or may not be contagious or communicable.

Contagious diseases are a type of infectious disease which is caused by receiving living germs directly from a person who is afflicted with the disease or by contact with a secretion of his or with some object which he has touched. Many infectious diseases are not contagious, for some special method of transmission or inoculation of the germs is required.

Immunity is the state of resisting or the power to resist the development of a (given) disease, especially of resisting infecting microorganisms or their products. Active immunity is acquired through the production of antibodies within the immune organism (the body). Passive immunity is the immunity acquired through the injection of a serum (from another individual).

Some communicable diseases still are resistant to antibodies and remain serious health problems. Some microorganisms have developed resistance to antibodies.

A knowledge of the role of bacteria in communicable diseases is basic to understanding them. Bacteria are minute, unicellular, plant-like organisms without chlorophyll. Their presence was discovered by Antony van Leeuwenhoek in 1676. The primitive microscope which he used was a simple, biconvex lens clamped between two metal plates. Leeuwenhoek believed that the air was the source of these microscopic creatures.

Although the majority of the communicable diseases respond to the antibiotics, only a few of the virus diseases react favorably to this kind of treatment. The fungus and staphylococcic diseases are also resistant to antibiotics.

The leading fatal communicable diseases in the United States are pneumonia and tuberculosis, although tuberculosis is rapidly declining as a cause of death.

ATHLETE'S FOOT

A great many fungi exist, but only a small number infect humans. Some fungi infect only the upper, outer, superficial tissues like the skin, hair, hair follicles, and nails; others infect the deep tissues like the lungs, liver, brain, bones, and intestines. Athlete's foot is classed as one of the superficial nonserious fungus infections. It is called tinea pedis, and it is one of the dermatomycoses. Estimates indicate that half the population contract athlete's foot sooner or later. Feet that perspire easily are more susceptible than others.

Tinea pedis begins with fissures (cracks) in the skin between the toes and spreads to the soles and nails. Tiny blisters form, accompanied by itching. Scratching and rubbing may cause superimposed infection with other germs, so that complications occur. Furthermore, hypersensitivity to the fungus may cause pimples and blisters on the hands.

Keeping the feet and skin between the toes dry helps prevent the fungus infection. It is believed by some authorities that powder sprinkled between the toes helps in prevention. Drying the toes carefully after bathing is important. Another essential is cleanliness of the floors of dormitories, schools, gymnasiums, swimming pools, and bathing areas.

Once the infection sets in, the treatment consists of lotions, powders, ointments, and, in some cases, one of several new drugs now

available. These may be either applied to the affected area or taken by mouth, depending upon the individual case. Self-treatment and the use of advertised preparations by nonmedical persons are not recommended.

BOILS

A boil is also called a furuncle. It is caused by a staphylococcus infection of the hair follicle and the tissue around the hair. Pus forms and a boil develops.

For only one boil, the use of warm, wet dressings followed by sterile, dry, light dressings to prevent contamination of other parts of the skin is usually sufficient. When boils spread so that there are many of them or when they keep coming back, the treatment is more complicated. An examination may reveal an underlying disorder like diabetes, anemia, malnutrition, lack of gamma globulin in the blood, and other conditions. Treatment may include the use of cleansing antiseptic lotions, wet antiseptic dressings, or antibiotics; a daily change of clothes; or the opening of some boils if they are "ripe." The doctor will determine the time for such treatment.

CARBUNCLES

A carbuncle forms when several boils come together to form a single large one. Thus, a carbuncle has several openings and it is deeper and larger than a single boil. A common site for a carbuncle is the back of the neck or the lower back region. The staphylococcus bacteria is usually responsible for the infection.

Many years ago, before antibiotics, the carbuncle often had to be opened widely to let out all the pus so that healing could occur. Today not all carbuncles need surgery. The treatment consists of antiseptic cleansing, warm and wet dressings, and antibiotic ointments. Antibiotics taken by mouth may be necessary; surgery may be performed, if healing does not proceed steadily.

THE COMMON COLD

The most prevalent of all human infections is the common cold. It is caused by one or more viruses, smaller than bacteria. Symptoms of the common cold consist of peppery nose, dryness of the throat, sneezing, tearing eyes, slight to moderate coughing, fever (sometimes), and a general feeling of being "run down."

The common cold is spread from one person to another by coughing and sneezing, by dust particles in the air, and by such contaminated articles as handkerchiefs, tissues, and articles of clothing. Usually when complications occur they are due to the presence of bacteria in addition to the virus, and a lowering of resistance. Thus, such complications as sinus infections, bronchitis, pneumonia, enlarged and infected glands in the neck, and a few others may occur. The bacteria that are commonly associated with the complications of the common cold are streptococcus, staphylococcus, pneumococcus, and a few others.

DIPHTHERIA

Diphtheria is caused by a germ known as Corynebacterium Diphtheriae (Klebs Loffler bacillus). Formerly, diphtheria was a common disease, and there were many cases and many deaths. The diphtheria bacillus spreads from person to person by secretions of the nose and throat, either by direct contact or by contaminated handkerchiefs, dishes, food (milk), and other articles. There are some persons who are carriers of the diphtheria bacillus and who, themselves, are not sick with the disease but who can spread it to certain other persons.

The symptoms of diphtheria include a sore throat with a membrane the color of a dirty grayish material, called an exudate, appearing on the tonsils or the back of the throat. The throat is very sore; swallowing is difficult. Glands in the neck are often enlarged, and often there is headache and fever with possible chills. The person with diphtheria feels miserable. Complications include the obstruction of breathing, a serious type of heart trouble, or damage to the kidneys.

The most effective way to prevent diphtheria is to give enough diphtheria toxoid to an adequate number of children, preferably before they are six months old. The Illinois State Health Department distributes diphtheria toxoid free of charge to all local health departments. Private doctors may obtain supplies of diphtheria toxoid without charge, for use in their private practice. When a person receives inoculations

of the diphtheria toxoid, substances known as antibodies are built up in the blood and tissues. Specifically, the antibody is known as antitoxin. It has become virtually a routine procedure among pediatricians to immunize infants and children against diphtheria in conjunction with the inoculations against tetanus, whooping cough, and poliomyelitis.

GONORRHEA

Gonorrhea was known to the ancient civilizations. In 1879 the gonococcus was described by Neisser, and it is presently known as Neisseria gonorrhea.

This is the most common of the venereal diseases. It is believed to be three to ten times more prevalent than syphilis and, like syphilis, is, in many cases, believed to be unrecognized and unreported.

Gonorrhea begins as a local infection. It is caused by passing the gonococcus germ from one person to another through close body contact. The most vulnerable areas of infection are the sex organs and the eyes. The first symptoms usually occur within seven or eight days after infection. In men, the first symptom is a burning sensation during urination. Soon thereafter, there is a pus discharge from the urine opening, and the infection may spread backward to other parts of the genital area. In women, the burning sensation in the genital area may not be felt and the discharge may be mistaken for some other kind of discharge. Urination may be painful, and the infection may spread to certain glands and to the Fallopian tubes. Men are usually aware that they have the disease; women may not be aware of the infection.

A physician, after making a thorough examination, can diagnose gonorrhea accurately. The diagnosis is made on the basis of a knowledge of the history of exposure and an examination of the discharge.

Arthritis following gonorrhea is the most serious of the complications. The disease may attack the heart, but this is rare. If the germ gets into the eyes, it may cause blindness. Thus, silver nitrate (or penicillin) "drops" are put in the eyes of newborn infants, as a preventative. The disease may cause pain and damage to the sex organs. Untreated gonorrhea is one of the reasons why men and women may not be able to have children.

Penicillin is the choice treatment and will cure most cases. Any physician knows how to treat the disease; treatment may take only a short time.

The most effective ways to reduce the incidence of venereal disease are through education, premarital examination, and adherence to a way of life which is based upon a high level of moral behavior.

HEPATITIS (Yellow Jaundice)

Hepatitis is an inflammation of the liver that can be caused by viruses, germs, poisons, and other substances. The infectious agents can be viruses, spirochetes, protozoa, and bacteria. The toxic agents can be carbon tetrachloride, arsenicals, and other chemicals.

Hepatitis, of the virus type, is usually divided into two types: infectious (epidemic) and serum. It is possible that these two types are practically one and the same, although the incubation period of the former is 20 to 35 days and of the latter 50 to 130 days or longer.

Infectious hepatitis may spread by living under crowded conditions, through contamination of food and water by feces, and by poor sanitation in toilet habits of those persons who may be carriers. The symptoms of hepatitis may be loss of appetite, nausea, fever, tenderness and enlargement of the liver, and pain in the right upper part of the abdomen. Jaundice (yellow color of the skin) may appear. Many mild cases do not have the jaundice. The symptoms of the gastro-intestinal tract may persist for about a week or two and then gradually subside as the jaundice disappears. The spleen may be enlarged in some of the cases. Sometimes there is a generalized itching and an allergic type of rash. Diarrhea may occur.

Some people have the virus in their blood; therefore, the giving of blood transfusions has spread serum hepatitis. Similarly, the giving of blood plasma, in occasional instances, can spread hepatitis. Another

way of contracting serum hepatitis is through contaminated needles and syringes. Careful selection and processing of blood plus efficient sterilization of needles has reduced this risk to a minimum. One-shot, disposable syringes and needles are now being used in hospitals and in doctors offices.

Sometimes it is difficult to distinguish hepatitis from such other diseases as mononucleosis. The two diseases may be present simultaneously. Hepatitis is usually milder in children than adults. Adult carriers have been known to be infective for several weeks. In dealing with hepatitis, prevention is important. There is still no vaccine that will prevent hepatitis. Other means of prevention, therefore, must be used; they include the practice of good health habits, especially those pertaining to personal cleanliness and freedom from the contamination of food and water by feces. Sanitation, including that in school lunchrooms, must be good.

Gamma globulin, which is a blood fraction, is thought by some to prevent hepatitis if given before the symptoms begin. Therefore, it is given to those persons who have been exposed to hepatitis. Exposure to infectious hepatitis occurs through familial contacts and, outside the family, through sleeping with infected persons, consuming food which has been prepared or handled by them, or having a long and sustained contact such as might occur in a camp. For the treatment of the case itself, a diet rich in protein and carbohydrate and low in fat is usually prescribed.

One of the dangers of hepatitis is the possibility of a damaging cirrhosis of the liver.

IMPETIGO

Impetigo is an infection usually caused by a germ called the staphylococcus. It may occasionally be caused by the streptococcus. It usually occurs on the face or hands but may be found on other parts of the body. Beginning with a small red spot, it finally becomes a pus blister. A crust forms which is yellow in color. The infection can be spread from one part of the skin to another by scratching and rubbing. Some cases can spread into the bloodstream. Even a simple impetigo can last for weeks if untreated.

Prevention is based upon habits of good hygiene. After the infection is contracted, all close contacts with the sick person and everything he uses or touches must be avoided. A doctor should be called upon to treat this type of skin condition.

INFECTIOUS MONONUCLEOSIS

Infectious mononucleosis is also known as glandular fever or "mono." It is probably caused by a virus, but this has been hard to prove. It is very common and occurs mostly in children under 13 years of age and in young adults. The age of greatest susceptibility is considered to be from shortly after puberty through the most active period of courtship (15 to 30 years of age).

This disease can be very mild, but occasionally it can be so very severe that life is endangered. It can start out with fever, sore throat, and weakness; often the glands in the neck are enlarged. Fever is usually persistent. This illness affects many organs and occasionally causes such complications as hepatitis with jaundice (yellow discoloration), brain and spinal cord trouble with weakness and even paralysis, skin rash, inflammation of the eyes, and many other symptoms.

To determine whether mononucleosis is present, a doctor conducts two tests of importance: one, to find abnormal lymphocytes in the blood smear test; the other, to get a positive serum test known as the Paul-Bunnell or heterophile test.

The treatment of this condition usually consists of trying to make the patient as comfortable as possible and maintaining the patient's strength with adequate food, rest, and medication that will relieve some

of the more annoying symptoms. Antibiotics are often used.

This disease often affects students, interns, nurses, and other medical workers. We have a long way to go in understanding it. One comforting thought is that the disease is very rarely fatal.

INFLUENZA

Influenza is a highly communicable disease caused by certain viruses. It occurs sporadically (here and there), epidemically (many cases at about the same time in a particular area), and pandemically (many cases all over the world). There have been many epidemics of viral influenza in the past few years. The most extensive pandemic that occurred recently was the severe one of 1918 and 1919.

The viruses associated with the occurrence of influenza are usually type A, type B, and the Asian strains. Primarily, influenza affects the tissues of the respiratory tract. Influenza virus infections are frequently complicated by the presence of disease-producing germs, such as the pneumococcus and the staphylococcus. These complicating germs make the influenza much more severe than it otherwise might be.

The incubation period of influenza is one to two days. The symptoms often include a chill or chilly sensations, fever, headache, eye pains, dry throat, a feeling of weakness, and muscle pains. Sometimes nausea, vomiting, dizziness, a cough of varying severity, hoarseness, and pain in the chest are also present. The viral type of influenza lasts three to five days. However, when complicating germs are present and take hold, the disease lasts longer and is more severe.

The diagnosis of influenza is difficult because culture and identi-

fication of virus influenza are too costly and impractical on an individual basis. Cultures of viruses are taken and identified in large laboratories, such as those connected with the United States Public Health Service, the National Institutes of Health, and some research centers in some of the states. For this reason, locally the diagnosis of influenza is based upon the awareness of other cases in the neighborhood and upon knowledge of the approximate type of symptoms of influenza.

The most common serious complication of influenza is pneumonia. Other complications are infection of the middle ear, pus in the urine indicating kidney trouble, and arthritis.

No specific treatment has been developed. The symptoms are treated as they arise. Rest is important. Plenty of fluids, sedatives when indicated, a diet in accordance with the patient's appetite and desires, and a careful watch for complications are necessary. Broad-spectrum antibiotics are often used in influenza in order to deal with the complicating germs.

Prevention of influenza may be effected by means of a killed vaccine. This has been used on a large scale around the world. Many doctors believe that the vaccine affords protection in about 60 to 70 per cent of persons receiving the vaccine. On the other hand, some doctors do not believe the vaccine is worthwhile. Certain groups of people, such as pregnant women, the elderly, and those with chronic diseases (heart, kidney, and others) should receive the vaccine.

MEASLES (Rubeola)

Regular measles is a more severe disease than German measles. It is caused by a virus, which is spread by nose and throat secretions and contaminated objects and which can be carried in the air for short distances. The disease is extremely common; approximately every 27 months there are epidemics in closely settled communities. The symptoms of measles include a slight cold at the start, followed by coughing and a low fever. About the third or fourth day the fever goes higher, the cough gets worse, and a skin rash appears. The rash usually begins on the forehead and at the sides of the neck around the ears and on the face. It spreads rapidly downward. Tiny spots called Koplik spots may be seen in the mouth. These spots occur inside the cheeks in about 90 per cent of all measles cases and are characteristic of measles.

The most important complications of measles are encephalitis and pneumonia; there are other minor complications. A measles virus vaccine has been developed recently. Up to now, gamma globulin, which is a product from the blood, has been the only substance used to prevent or modify measles. However, gamma globulin is short-acting; the measles virus vaccine is expected to be a long-acting preventive.

MEASLES, GERMAN (Rubella)

German measles is a mild disease, caused by a virus. It is spread through nose and throat secretions and can be carried in the air for short distances. The only real importance that German measles has is in relation to pregnancy and congenital deformities. If a woman is less than three months pregnant and contracts German measles, there is some likelihood that the baby will be born with heart disease, cataracts of the eyes, and/or other deformities. It is advantageous, therefore, for young girls to get German measles before they are fully grown.

MENINGITIS

The general class of meningitis infections is characterized by infection of the throat and bronchial tubes. This is followed by a spread of germs to the blood stream; in the last stage the germs attack the central nervous system. One type of germ causing this infection is called the meningococcus.

The symptoms of this disease are fever, headache, skin rash, and, in the last stage, a stiff neck so that an attempt to bend the head forward is very painful. The occurrence of nausea and projectile vomiting may indicate central nervous system involvement. Diagnosis can be made by recognizing the symptoms and the characteristic skin rash. The germs often can be recovered from the skin rash. In the later stages, if the germ involves the brain coverings, a spinal puncture will show pus in the spinal field.

There are many types of bacteria and viruses that cause meningitis. Some of the most common organisms known to cause meningitis are the meningococcus, the E. coli, the H. influenzal germ, the pneumococcus, and many types of viruses.

The treatment of meningitis infections is a serious medical problem if the patient is not merely to survive but also to recover with as few complications as possible.

MUMPS (Epidemic Parotitis)

Mumps is a disease caused by a virus which is found all over the body and does not limit itself to the salivary glands of the face and neck. This virus may inflame the reproductive organs, the pancreas, the thymus gland, the thyroid gland, the brain and brain coverings, and other body parts. The mumps virus has a special affinity for the salivary glands and the sex glands.

The incubation period for mumps includes the period from exposure to the virus until development of the first symptoms, usually two to three weeks. Mumps is contagious for the period from a few days before the first signs until the swelling is completely gone. A baby under seven months of age usually will not get mumps if his mother had mumps. If the mother had mumps, some of the resistance bodies (called antibodies) go from the mother's blood across the placenta into the baby's blood. These resistance bodies protect the baby for the first few months. The resistance bodies gradually disappear; after their disappearance, the infant becomes susceptible. Mumps is a disease which is most common in children from five to fifteen years of age. However, a person of any age can contract it.

The symptoms of mumps may be fever, loss of appetite, and headache for one or two days; then the face swelling appears. Swelling occurs at the side of the face just below and in front of the ear, under the jawbone, or under the tongue. In 75 per cent of cases, both sides are

swollen. The swelling is firm and taut, but not too painful to the touch. One side may swell first and then, within a few days, the other. Usually, within one week the swelling is practically gone or diminishing; a few cases last longer.

Mumps spreads very easily, by means of droplet infection from one who is coming down with it or has it to the one who can get it. Once a person has mumps he almost always becomes immune to the disease.

There may be complications of mumps affecting the brain or the reproductive organs. In adults mumps may cause sterility. Meningoencephalitis is a rare occurrence consisting of inflammation of the brain and brain coverings.

There is no drug or remedy that is dramatic in the treatment of mumps. There is a vaccine and a skin test; however, they are not commonly used by doctors. Usually the patient is treated for the fever with rest, plenty of fluids, and a soft diet and is asked to avoid such foods as pickles, sharp citrus fruits, and the like.

PEDICULOSIS

Pediculus capitis, the head louse, infests the scalp hair. It causes itching and sometimes general discomfort. It disturbs sleep and, due to scratching, may cause secondary infection. Sometimes from this secondary infection, glands in the neck may become enlarged. Reproduction of the louse is by ova or eggs, which are called "nits." These are easily identified with a hand lens and appear as tiny cocoon-like structures attached firmly to the hair shafts.

Pediculus corporis, the body louse, does not strictly infest the body but lives in the clothing. It comes onto the body only to feed. The bite marks are less conspicuous than the scratch marks of the fingernails, which often appear on the upper back, sides of the body, and upper and outer arms. The inner garments, especially the folds and seams, should be carefully inspected for the lice.

Pediculus pubis is the pubic or crab louse. This usually limits itself to the pubic hair of the adult but may appear in the axillary hair (the hair in the armpits) and even in the eyebrow hair and the eyelashes.

The modern treatment of louse infestation is simpler than it was formerly. For the body lice, disinfecting by laundering the clothes and sprinkling with DDT is quickly curative and preventive. For the head and pubic lice, several drugs are not too unpleasant to apply, are simple to use, and are available by doctor's prescription. One or two applications takes care of the condition effectively.

PNEUMONIA

The term pneumonia embraces infection of the lung tissue by many different types of germs and viruses. While many of the organs and tissues of the body are affected by germs causing pneumonia, the main trouble is caused in the lung air spaces. Some of the germs which can cause pneumonia are the pneumococcus, the streptococcus, the staphylococcus, the hemophilus influenzal, other germs, and many viruses. In addition, pneumonia can occur in other ways; for example, if oily fatty drops are put into a baby's mouth or nose, the baby may aspirate this material into the lungs and develop what is known as oil pneumonia. Kerosene may be aspirated during vomiting and gagging if a baby or a child accidentally swallows some kerosene. (When aspirated into the lung, kerosene causes a very severe pneumonia.) There are also other types of pneumonias, such as ether pneumonia.

There are two factors involved in causing symptoms in pneumonia. One is the filling up of the lung air spaces with inflammatory products and germs. Pus usually forms; thus the lung alveoli are blocked and filled so that oxygen exchange is seriously hampered. The other factor causing symptoms is that germs growing and multiplying very rapidly inside the lung air spaces are very powerful in their damage-producing properties. As a result, toxins or poisons are formed. These toxins spread around the body injuring tissue wherever they appear.

Usually in pneumonia, germs and viruses themselves can be cultured from the bloodstream as well as from the lung air spaces. This indicates that pneumonia affects not only the lung air spaces but all the body tissues. Consequently, this is what makes it a very serious disease.

The symptoms of pneumonia, of course, differ with the age of the person and with the type of germ causing the pneumonia. In infants, the pneumonia process usually is present in both lungs. In young adults, very often, pneumonias will affect only a part of one lung or only one lung.

The mortality from pneumonia differs with the age of the patient and with the type of germ causing the pneumonia; it also differs with whether or not a medicine used will inactivate or kill the particular germ causing the pneumonia. For example, a pneumonia due to the pneumococcus will usually respond favorably to penicillin. This is also true of streptococcus pneumonia and some others. However, certain types of staphylococcus pneumonia are not affected by penicillin and are not controlled by the available harmless antibiotics. Sometimes a dangerous remedy has to be used for certain types of staphylococcus pneumonias in order to save a life. All cases of pneumonia should be brought to the attention of a physician to avoid taking any chances.

POLIOMYELITIS

Poliomyelitis is erroneously called infantile paralysis. This disease is caused by a virus (types I, II, and III), which may be spread by nose and throat secretions as well as by gastrointestinal contamination through drinking water and several other means. The symptoms may be mild or severe. A great many cases of poliomyelitis recover with absolutely no signs of paralysis. These mild cases may be characterized by headache, sore throat, slight fever, and slight muscular pains without any paralysis. There may be a slight stiff neck or a stiff back. Often, these types of cases escape detection.

Severe poliomyelitis is accompanied by paralyses of various types. In the last few years, a killed (Salk) virus vaccine has been used throughout the world and has sharply reduced the number of paralytic cases of infantile paralysis. Recently there has been developed an oral live (Sabin) vaccine which has been used extensively in this country and in other countries of the world. Vaccination against poliomyelitis is recommended.

RHEUMATIC FEVER

Rheumatic fever is directly connected with infections due to the Group A beta hemolytic streptococcus. There are many children and adults in the general population who harbor this streptococcus in the nose and throat. An infected throat due to the streptococcus will cause a painful sore throat; this is sometimes accompanied by fever or enlarged glands in the neck. Diagnosis must be made by means of a culture; mere visual examination of the throat is not sufficient. The results of a culture may be known in twenty-four hours or less.

Some children and young adults who get sore throats due to the streptococcus develop rheumatic fever. Some who develop rheumatic fever go on to develop rheumatic heart disease. Therefore, in order to prevent rheumatic heart disease, it is necessary to prevent and properly treat all sore throats immediately and, especially, sore throats which are caused by the Group A beta hemolytic streptococcus. If cultures are not taken, many cases of sore throat due to the streptococcus may not be treated for ten days. The most effective treatment for these particular streptococcus infections is penicillin. Some individuals who have contracted rheumatic fever may be on a continued prophylaxic program.

RINGWORM OF THE SCALP (Tinea Tonsurans)

Ringworm of the scalp is more common in children than in adults. Since a fungus is responsible, the term is a misnomer.

The fungi of ringworm of the scalp cause patches of grayish scales and broken hair. Since ringworm is sometimes difficult to diagnose with the naked eye, a Wood's lamp is used. It is a form of ultraviolet light and, in most cases, ringworm patches stand out in a greenish-white fluorescence. To diagnose ringworm definitely, the hair can be examined under a microscope and the fungi on and in the hair can be cultured.

Ringworm of the body and ringworm of the nails are extremely common. The same treatment mentioned below is used in the treatment of these ringworm fungi. Ringworm of the nails requires a longer period of treatment than either of the other two kinds.

Recently, a new drug caused a revolution in the treatment. Before this medicine was developed, the effective treatment of ringworm of the scalp took months or years. The drug enters the bloodstream and is carried to all parts of the body as well as to the deep layers of the skin. The growing hair carries the medicine upward where it meets the fungi attacking the hair. The medicine stops the fungi from doing any further damage.

SCARLET FEVER (Scarlatina)

Scarlet fever is an acute infectious disease which is caused by certain types of the hemolytic streptococcus. The primary infection is usually located in the pharynx; the organism multiplies and produces a potent soluble toxin which is absorbed into the bloodstream. Symptoms include fever, headache, delirium, nausea and vomiting, rapid pulse, and an eruption of the skin. The onset is sudden.

The disease resembles diphtheria in several respects. Both diseases start with throat infections, affect similar age groups, and are spread by droplet infection more often from a carrier than from an active case.

Active immunization against scarlet fever can be obtained, but side reactions are so numerous and the modern treatment with penicillin and the sulpha drugs is so effective that immunization is not commonly done. In general, penicillin is the choice treatment. When immunization is attempted, it is done only on those persons who react negatively to the Dick test.

The severity of the disease is extremely variable, not only in different parts of the world but also in different epidemics in the same locality. It is more prevalent in the northern parts of the United States than in the southern parts and occurs principally in the temperate

zones throughout the world. As recently as twenty years ago, scarlet fever was very prevalent in the United States. However, there has been a sharp decrease in recent years due to the use of penicillin and the sulpha drugs.

Scarlet fever is endemic and epidemic in the thickly populated urban areas and it tends to be sporadic in rural areas. Primarily, it is a disease of early childhood; most cases occur during the winter and spring months of the year.

SMALLPOX (Variola)

Smallpox is caused by a virus. Symptoms include fever, chills, severe head and back pains, and a rash. The rash appears in lesions which begin as spots and become nodules, blisters, and pustules progressively; finally, crusts are formed. Often, these leave scars.

Smallpox is a much more severe and serious disease than chickenpox. Many years ago, it was a highly serious disease often resulting in death. Sometimes it would wipe out entire villages. In recent years, smallpox has been practically absent from the United States. It still exists in many other parts of the world. In the United States in the last few years, the smallpox cases that have occurred have been relatively mild despite the lack of an adequate vaccination status. However, if smallpox of a virulent type were to be introduced, smallpox would again occur; it might increase in severity and could again wipe out whole communities unless halted by emergency vaccinations.

Vaccination is necessary during the first 6 months of life. It is performed with a virus vaccine. The proper result is an adequate scar, showing that the smallpox vaccination "took." The vaccination is an absolute preventive in almost all instances. The resistance established by a vaccination lasts a varying length of time, depending upon each person's own tissue reactions. Public health authorities recommend a revaccination every three to five years even though, in some instances,

resistance from a vaccination against smallpox may last five, ten, fifteen, thirty, or more years. Revaccination is necessary at once when exposure or probable exposure has occurred. In this country, a smallpox vaccination is almost always placed on the upper, outer portion of the left arm.

SYPHILIS

Some authorities believe that syphilis was known in Europe before the first voyage of Columbus to the Western hemisphere. Others believe that it appeared later. No one really knows how long the disease has been in existence, but it is known that it has been spread throughout the world since the fifteenth century.

For many years it was thought that syphilis and gonorrhea were the same disease. This was a natural error because both of these diseases may be contracted by engaging in promiscuous sexual relations. However, about 1831 it was discovered that these were two different diseases.

In 1905, the cause of syphilis was discovered, and, in 1907, Wasserman developed a blood test for the detection of syphilis. Although an arsenic compound and bismuth were used in treatment during the early 1900's, it was not until the discovery of penicillin in 1943 that a really effective and relatively simple cure was found.

Today, it is believed by members of the medical profession that many people have syphilis who are not aware of it or whose condition is not reported to health departments. Some contract syphilis and are not aware of the infection until severe symptoms are present or until the disease is discovered during an examination for some other reason. Of the number of reported cases in the United States, there has been a decided increase in the communicable type of cases during the last few

years. A marked increase has occurred in the twenty- to twenty-four-year-old age group, but there has been a very sharp increase in the number of cases in the fifteen- to nineteen-year-old age group. These figures are indicative of the trends in Chicago as well as in the rest of the United States.

Syphilis is a disease contracted by close body contact such as the mouth and by infected untensils, as well as by sexual relations. It is not contracted from contact with toilet seats. It is caused by a spirochete known as treponema pallidum. The symptoms occur in several stages. The first is called the primary stage and consists of a sore or chancre which appears in or near the genital or other contact area about three or four weeks after the person becomes infected. Often it is unnoticed and usually it disappears in four to six weeks. The second stage begins five to six weeks after the appearance of the first sore. The most characteristic symptom of this stage is a rash which occurs on the skin, on the muccus membrane of the mouth, and in the genital area. During this stage, as during the chancre stage, the spirochetes can be found in large numbers in any of the open sores. After a few weeks, the second stage subsides. The third, or tertiary stage, begins after the lapse of some years. This is the stage in which individual organs of the body, such as the brain, spinal cord, heart, liver, and other organs, show signs of damage inflicted by the spirochetes.

During the first and second stages, a physician can diagnose the disease by finding the spirochetes in the sores. After the sores have disappeared, the diagnosis is made by what is known as a positive blood

test. The treatment of syphilis is easy and effective if there is early detection. Penicillin is the choice remedy. If communicability from one person to another is to be controlled, it is essential that the disease be detected quickly and brought to the attention of a physician during the early stages.

During the years from 1940 to 1946, the United States Public Health Service conducted a large-scale drive to eradicate syphilis in this country. The drive became a major part of the health program during World War II and the results were very gratifying. However, in the past three to five years, there has been a sharp increase in the incidence of this disease.

The most effective ways to reduce the incidence of venereal disease are through education, premarital examinations, and adherence to a way of life which is based upon a high level of moral behavior.

TETANUS (Lockjaw)

Tetanus is caused by the absorption of the spore-forming organism, clostridium tetani. Infection is almost always acquired from a contaminated wound. Tetanus occurs most frequently in areas where soil contamination is heaviest and where standards of cleanliness and the care of wounds are lowest.

Injuries which may lead to tetanus include compound fractures, puncture wounds, crushing injuries, extensive burns, and gunshot wounds. They occur, especially, in any of these which are contaminated by soil, where the skin is dirty, where wounds have not been cleaned properly, or where contaminated tissue has not been removed surgically. The disease frequently follows puncture wounds which are caused by nails, firearms, and splinters and may result from a very trivial scratch, insect bite, or superficial abrasion.

In the civilian population, as distinguished from the military, the greatest hazard from tetanus occurs in the age group up to fifteen years and in farmers, horsemen, and others whose injuries are especially liable to be contaminated with tetanus spores. Tetanus is highly fatal if there has been no previous immunization.

The incubation period is usually five to fourteen days. The generalized form of tetanus is usually insidious, and muscle stiffness, especially in the neck and jaw, occurs in increasing degree. Early

symptoms include headache, restlessness, chilliness, difficulty in swallowing, excessive irritability, and pain in the extremities. Muscular spasms, especially in the jaw, are characteristic.

Active immunization against tetanus is indicated for all children and adults. It is especially important in individuals sensitive or potentially sensitive to horse serum, such as those persons who have been treated with diphtheria or tetanus antitoxin.

Temporary passive immunity can be established by the injection of tetanus antitoxin when a person has been exposed to tetanus. Patients should be tested for sensitivity to this substance, however, before it is given. Prompt administration of tetanus antitoxin is recommended in patients with potentially contaminated wounds or injuries who have not previously had active immunization with tetanus toxoid.

It has become virtually a routine procedure among pediatricians to immunize infants and children against tetanus in conjunction with whooping cough, poliomyelitis, and diphtheria. Three injections of the multiple preparation are given at intervals of about one month or more with the first injection being administered soon after the age of three months.

There is no known method of controlling tetanus after the poison produced by the tetanus organisms has become fixed to nerve tissue. The only satisfactory protection is obtained by immunization against the disease.

TUBERCULOSIS

Tuberculosis is caused by the tubercle bacillus. The disease spreads from one person to another. In spite of many fine control measures (including the pasteurization of milk) instituted in recent years and in spite of several excellent drugs that have been developed to combat tuberculosis, there is still a large incidence of it all over the world and in this country. A person contracts tuberculosis by inhaling tubercule bacilli coughed out by another person who has the so-called "open" case of the disease (one with bacilli in the sputum).

Tuberculosis is not easily detected unless the skin test for it is taken and, in addition, an X ray of the chest and sputum examinations or stomach washings are performed. For example, there are some types of cases which cannot be detected by examining the sputum and which cannot be detected by examining a person with a stethoscope. Such cases may be detected by an X ray of the chest. The usual procedure begins with a skin test. The skin test that is most accurate is called the Mantoux intradermal skin test. If this test is positive, an X ray should be taken to see whether a person has an active case. If a person has active tuberculosis, there may be fever, poor appetite, loss of weight, weakness, malaise, and other symptoms, depending upon the severity. However, these are late symptoms; by the time they appear, the best chances for recovery have been lost.

Tuberculosis attacks the lungs, primarily, although any organ of the body can be attacked by the tubercle bacillus. The germ destroys the lungs.

A positive Mantoux tuberculin skin test means the person was exposed to someone with active tuberculosis and inhaled live tuberculosis germs. It does not mean that the person has active tuberculosis, because in most instances the body defenses build a firm wall around the germs inside the lung. X rays of the chest and other examinations show if the disease is active. Therefore, anyone with a positive test should have an X ray approximately every year and such other treatment as is medically recommended.

Excellent drugs are now available to heal most cases of active tuberculosis as well as to lessen the danger of its developing from an exposure into an active case. About 15 per cent of public school children and about 10 per cent of parochial school children in big cities show a positive test. They are called tuberculin positive reactors. In rural areas, the percentage is lower. The higher percentage shows that the child population in big cities is heavily seeded and that tuberculosis is still a public danger.

WHOOPING COUGH (Pertussis)

This is an acute infection of the respiratory tract caused by hemophilus pertussis. In typical cases, it is characterized by a series of repeated spasms of coughing ending in a forced inspiration (whoop) and sometimes followed by vomiting. The incubation period varies from seven to fourteen days. The course of the typical disease is generally six weeks and occurs in three stages: catarrhal, spasmodic, and convalescent, each lasting about two weeks.

The onset is usually insidious with a mild cough which often occurs at night. The cough becomes progressively more intense; nasal catarrh, sneezing, and loss of appetite are frequently present. Near the end of the second week the cough becomes markedly aggravated. After the fourth week, the disease passes gradually into a period when the number and severity of the paroxysms of coughing decrease, vomiting is less frequent, and the appetite returns. Bronchitis, middle ear infection, bronchopneumonia, and bronchiectasis are frequent complications.

The disease is worldwide in distribution and exists endemically and sporadically in most of the thickly populated urban communities. It occurs epidemically at intervals of from two to four years. The communicability rate is high. Although it may occur at any age, it is, mainly, a disease of early childhood. Individual susceptibility to the disease is great and the newborn infant is usually highly susceptible.

Most of the deaths due to whooping cough occur in children under the age of one year and a large number of these occur before the age of six months. Consequently, vaccination is done soon after the age of three months. It is now common practice to immunize against whooping cough in conjunction with poliomyelitis, diphtheria, and tetanus.